

REVIEWS

Hall and Ingall on Illinois Forests*

This important publication seems to be little known to botanists, and the reviewer was wholly unaware of it until it was about seven years old; but it deserves to be brought to the attention of readers interested in such matters even at this late date. Both the authors were (and are?) connected with the U. S. Forest Service, and the first-named is also the author of a preliminary report on the forests of Tennessee, published by the Geological Survey of that state about the same time.

As Illinois was originally about two thirds prairie, and most of the forest (as well as prairie) has long been superseded by cultivated fields, on account of the prevailingly fertile soils, one might not expect to find much of interest in a report on the existing forests of the state. The whole state is covered in a general way, but statistics are given only for the 26 most densely wooded counties; one in the driftless area in the northwest corner, two between the Illinois and Mississippi Rivers on the west side of the state, and 23 in the extreme south. These counties include less than one fifth of the area of the state, but about one third of its forests. (They contained at that time about a million acres of woodland, which Hall and Ingall thought to be about half the state total; but the results of the U. S. census of 1910, which were not available until a little later, showed over three million acres of woodland on farms in Illinois, and there is of course a little outside of the farms also.)

A small map in the introductory portion of the report divides the state into seven statistical divisions, and indicates the percentage of forest in each in 1880, following a book about the West by Robert P. Porter (director of the 11th Census). (The censuses of 1890 and 1900 did not give the acreage of woodland on farms, like those of 1870 and 1880, but that of 1910 did; too late however to be taken advantage of in the report under considera-

* Forest conditions in Illinois. By R. C. Hall and O. D. Ingall. Bull. Ill. State Lab. Nat. Hist. 9: 173-253. *pl.* 21-36 and frontispiece. 1911.

tion, as already indicated. Some of the results of it will be given below for comparison with Hall and Ingall's estimates.)

The first table in the report gives for nearly every county studied the total area, the wooded area, the total stand of timber, and the area of each of three types of forest: namely, bottoms, level uplands, and hills. Descriptions of each type follow, with many local details. Tables 2-4 give the percentages of different species of trees in bottoms, hills, and level uplands in the southern counties, and tables 5 and 6 similar data for bottoms and uplands in the three more northerly counties studied. (Even yet there are very few other publications giving the percentage composition of the forests for so large an area.) The species are not all separated in the statistics, however, many related ones of similar economic properties and not easily distinguished in winter and early spring (when most of the field work for this report was done) being lumped together, as in the case of the various black oaks, white oaks, hickories and ashes.

About three pages are then devoted to an account of the local distribution of the more important trees throughout the state, followed by a list of 129 species (including several large shrubs and introduced species), with technical and common names, but no indication of distribution or abundance.

The second half of the report is taken up mainly with questions of ownership and taxation of forest lands, utilization and management of forests, growth statistics of several species, forest protection, and suggested legislation. It differs from many if not most reports of similar size written by professional foresters in containing a bibliography; but most of the citations give no indication of the length of the papers cited (a very common omission), and about 15 per cent of the titles are of manuscripts, which few users of the report can ever hope to see. The illustrations are splendid, mostly full-page half-tone plates, and will be a revelation to those who have crossed Illinois on the railroads and seen little but settlements and vast level corn-fields. The one of *Pinus echinata* on the hills of Union County is especially noteworthy, being perhaps the only photograph ever published of that species growing naturally in Illinois.

From the first six tables an interested person can work out in a few hours the relative abundance of the species (or groups of related species) in different regions, and other phytogeographical data, such as are not yet available for many other parts of the country. This the reviewer has done, with the results set forth below. As the county is the unit of area in the statistics one cannot follow natural boundaries very closely, and thus an element of inaccuracy is introduced, which makes it hardly worth while to give the computed percentages for each species or group of species. In each of the following five regional lists the commoner species or genera are arranged in order of abundance as determined from the statistics, and the names of those which are more abundant in a given region than in the other four are printed in small capitals, which gives an additional basis for comparison without using any more words. Those whose percentages fall below 1 are omitted in most cases.

In the northern driftless region, typified by Jo Daviess County (and better by a number of neighboring counties in Wisconsin), thirteen per cent of the area was estimated by Hall and Ingall to be wooded, with an average timber stand of 805 cubic feet per acre; and 13 per cent of the forest is in bottoms and 87 per cent on uplands. (According to the 1910 census 17 per cent of the farm land in Jo Daviess County was woods, which would make 15.2 per cent of the total area even if all the land outside of farms was destitute of trees.) The commonest trees seem to be *QUERCUS VELUTINA* and other black oaks, *Quercus alba* and other white oaks, *Ulmus americana*, *QUERCUS MACROCARPA*, *Hicoria* spp., *TILIA AMERICANA*, *Acer saccharinum*, *SALIX* spp., *BETULA LENTA*, *ACER SACCHARUM*, *JUGLANS NIGRA*, *Fraxinus* spp., *Populus deltoides*, *P. tremuloides?*, and *Platanus occidentalis*. The various oaks make up about 56 per cent of the total.

On the west side of the state there is a small area south of the terminal moraine, including Calhoun County (almost the only one in Illinois without a railroad) and part of Pike. According to Hall and Ingall only 12 per cent of the area of these counties was covered with forest (but the census enumerators about the same time found 20 per cent of the farm land wooded, which

would be equivalent to 18.4 per cent of the total area). The estimated stand of timber is 760 cubic feet per acre, and the bottom and upland types constitute about one third and two thirds respectively. The commonest trees seem to be *Quercus velutina* (etc.), *Q. ALBA* (etc.), *ULMUS AMERICANA*, *Hicoria* spp., *Quercus palustris*, *ACER SACCHARINUM*, *PLATANUS*, *POPULUS DELTOIDES*, *Tilia americana*, *Fraxinus* spp., and *GLEDITSIA TRIACANTHOS*. The percentage of oaks is almost exactly the same as in Jo Daviess County.

In the portion of the state covered by "lower Illinoisan" glaciation, a comparatively level plain in the southern half, with more forest than prairie originally, apparently, Hall and Ingall found less than 10 per cent of forest in the counties they investigated. But the contemporary census figures give 13.7 per cent of the farm land wooded in the same counties, and 12.5 per cent in the whole group of counties covered with that type of drift, which includes a few additional ones lying farther north and presumably having a little more prairie originally. (Farms cover nearly 90 per cent of the total area now, and the remainder is probably mostly towns and cities.) With respect to types, or topography, the forest is about 20 per cent bottoms, 5 per cent hills or slopes, and 75 per cent level uplands. The estimated stand is 700 cubic feet per acre, and the commonest trees seem to be *Quercus velutina* (etc.), *Q. alba* (etc.), *Q. STELLATA*, *Q. palustris*, *Hicoria* spp., *Ulmus americana* (etc.), *QUERCUS MARYLANDICA*, *Liquidambar*, *QUERCUS IMBRICARIA*, *Acer saccharinum*, *Fraxinus* spp., and *Quercus pagodaefolia*. The various oaks constitute over 70 per cent of the total, a figure perhaps not exceeded in any other equal area in the world.

In the unglaciated hill country near the south end of the state, sometimes called the Ozark region, about 20 per cent of the area is wooded, according to Hall and Ingall, which agrees pretty well with the census figures for woodland on farms. (But about 15 per cent of the area is not in farms, and practically none of that is prairie, and the settlements cannot cover more than a fraction of it, so that the total forest in 1910 must have been something like 30 per cent.) In the counties selected (by the reviewer)

the forest types run about 15 per cent upland plain, 60 per cent hills, and 25 per cent bottoms; but a more exact location of the northern boundary would practically eliminate the upland plain type. The existing forests are somewhat denser than in the three regions previously noted, having about 900 cubic feet of timber per acre. The commonest trees are *Quercus velutina* (etc.), *Q. alba* (etc.), HICORIA spp., *Liquidambar*, *Quercus palustris*, *Q. stellata*, *Ulmus* spp., *Fagus*, FRAXINUS spp., *Acer saccharinum*, *Nyssa uniflora*, *N. sylvatica*, LIRIODENDRON, *Quercus marylandica*, *Acer Saccharum*, and *Quercus pagodaefolia*. The percentage of oaks is about the same as in the first two regions. In addition to the species indicated by the typography as being more abundant here than in other parts of Illinois there should be mentioned PINUS ECHINATA, which is said to grow nowhere else in the state, but is too scarce to enter into the statistics.

In the coastal plain or Tertiary region, which in Illinois corresponds approximately with the three southernmost counties, Hall and Ingall estimated the forest area at 31 per cent, which is probably none too much. (The 1910 census gives 26.8 per cent of the farm land wooded, but about one fourth of the area is not in farms, and if only as much as half of that was woods it would bring the total forest up to the figure named.) About two thirds of the existing forest is in bottoms and one third on hills, and the average stand is the highest of all, 1373 cubic feet per acre. The commonest trees seem to be *Quercus velutina* (etc.), Q. PALUSTRIS, LIQUIDAMBAR, *Quercus alba* (etc.), FAGUS, *Ulmus* spp., NYSSA UNIFLORA, *Hicoria* spp., *Acer saccharinum*, *Fraxinus* spp., TAXODIUM DISTICHUM, NYSSA SYLVATICA, and *Platanus occidentalis*. The oaks here make up only about 39 per cent of the total.

It seems from this report that in Illinois *Juglans nigra*, *Populus deltoides*, *Betula lenta*, *Quercus macrocarpa*, *Ulmus americana*, *Acer Saccharum*, and *Tilia americana* are most abundant northward, and *Taxodium*, *Betula nigra*, *Fagus*, *Quercus stellata*, *Q. marylandica*, *Q. palustris*, *Q. imbricaria*, *Liriodendron*, *Liquidambar*, and both species of *Nyssa* southward. The reasons are probably chiefly climatic, but this will not hold for *Fagus*, unless

we follow Fernald and Rehder in recognizing two forms,* and find that only the southern form enters Illinois in any quantity. Or it may be that the beech avoids the richest soils, with abundant soil fauna, such as characterize most of Illinois; though it is regarded as one of the most typical "climax" trees by the ecologists or successionists of the Chicago school. *Quercus velutina* appears to be the most abundant tree in the state. There are five or six evergreens in Illinois, but none are abundant enough to appear in Hall and Ingall's statistics, and all combined they probably do not make up more than 1 per cent of the forest wealth of the state.

If similar statistics could be worked out for other states it would go far toward filling the long-felt want of an inventory of our forests, which are becoming scarcer and more valuable all the time. About the only obvious shortcomings of this report are that it did not cover the whole state statistically, a forest map intended to accompany it was omitted for lack of funds, and the species are lumped together too much in the tables; all of which could probably be remedied without great expense.

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Emerson and Weed's *Our Trees*†

Of the popular guides for the identification of trees, none is more attractively gotten up than this. To the fifth edition just out an introduction has been added, calling attention to the seasonal changes of trees. A full-page illustration is given to each species. Leaves, flowers and fruits have been photographed and a small inset view of the whole tree has been added. On the page facing the illustrations is the description calling attention to the distinguishing characteristics. Here related species not illustrated are sometimes mentioned, but the book is not intended to be complete in this respect. The arrangement and Latin names are those of Professor Sargent's *Manual of the Trees of North America* (with the ginkgo still in the Yew family);

* See Jour. Elisha Mitchell Sci. Soc. 33 117 (footnote). 1917.

† Emerson, Arthur I., and Weed, Clarence M. *Our Trees, How to Know them.* 5th edition, pp. xxi + 295, 149 illustrations. Philadelphia and London, J. B. Lippincott Co. 1918. Price \$3.50 net.